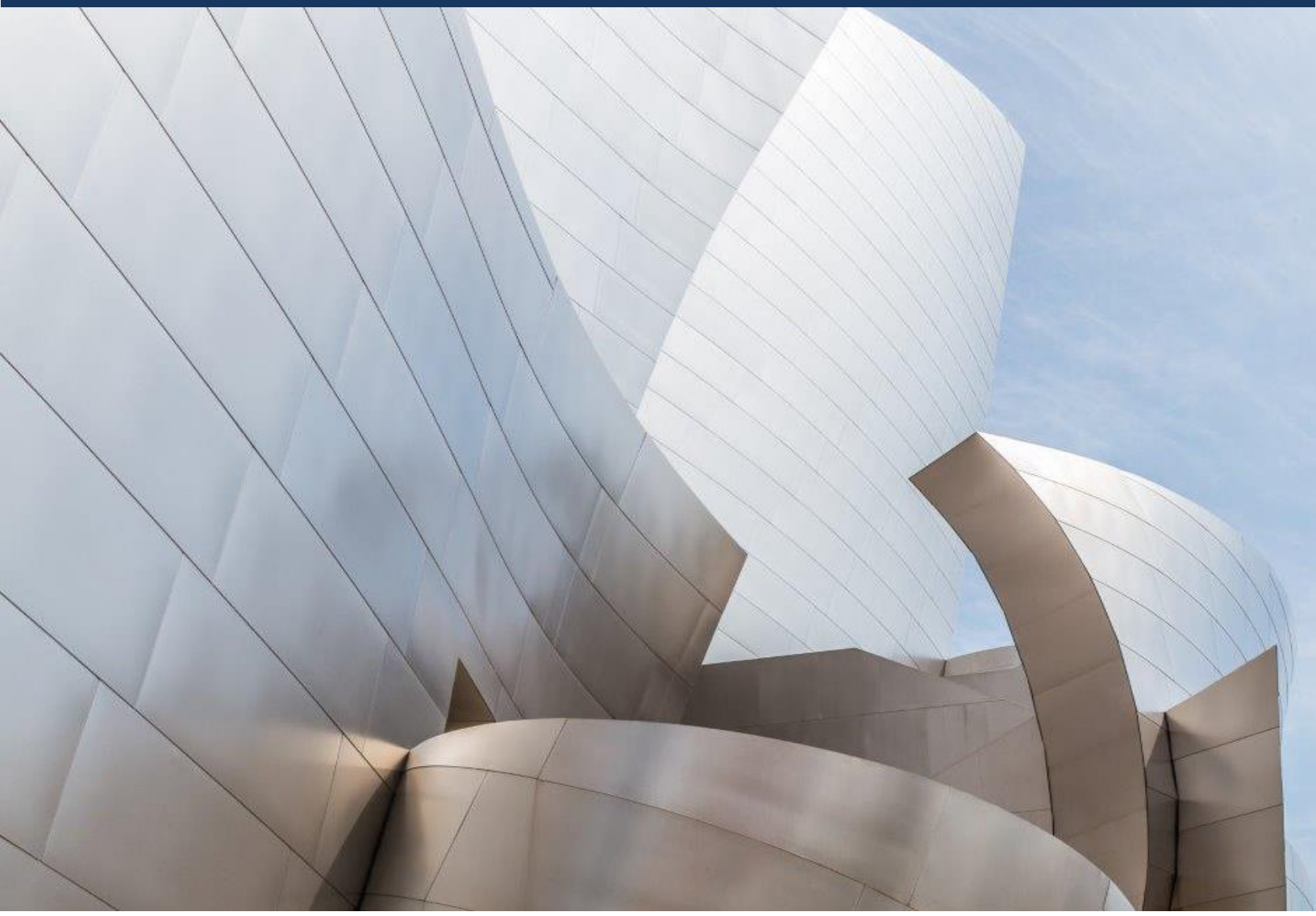
Bridging the Funding Gap: An Enterprise Perspective Post-Session Report

Produced by: GLOBE Series and The Delphi Group

June 2017



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ACKNOWLEDGMENTS

GLOBE Series and The Delphi Group would like to thank the sponsors for the Cleantech activities at *GLOBE Capital 2017: Financing the 21st Century*:

- Emission Reductions Alberta
- Sustainable Development Technology Canada
- Natural Resources Canada

With their support, the "Bridging the Gap: An Enterprise Perspective" working session at *GLOBE Capital* was an informative panel discussion that led to productive break out conversations amongst panel members and participants. It brought together actors from every part of the cleantech sector to share their experiences and insights at a time when consultation is playing a key part in shaping the future of the industry.

This post-session report was produced in collaboration by GLOBE Series, producers of *GLOBE Capital*, and The Delphi Group.

EXECUTIVE SUMMARY

Raising capital is critical along the innovation continuum as companies are looking to facilitate growth and scale for clean technologies.

In the working session "Briding the Funding Gap: an Enterprise Perspective," the CEOs of several cleantech companies shared their experiences trying to raise capital for development, demonstration, and deployment. The session took place during *GLOBE Capital*, an invitation-only summit that focuses on how companies and governments might access the pools of capital needed to spur the transition to a low-carbon economy. The CEOs offered constructive thoughts on how to bridge the funding gap that is limiting opportunity for Canadian firms.

Following a panel discussion, attendees broke into small working groups to discuss topics pertinent to raising capital for clean technology. Attendees discussed securing customers through government and private sector procurement as well as through cleantech export opportunities. Participants also discussed collecting cleantech data, and the allocation of government funding that could result from the data that is collected.

Each of these topics was especially relevant following the release of the 2017 Federal Budget, which included funding allocations for research and development, deployment and commercialization and export support, as well as cleantech data collection, and a federal cleantech procurement strategy.

The concept of risk permeated each discussion, from the panel to the breakout tables. The panel highlighted the importance of first customers as brand ambassadors. Breakout discussions emphasized the need for clearer communication from investors and government, and the benefit of collaboration between companies in the industry as a way to solve some of their growth challenges.

Table of Contents

ACKNOWLEDGMENTS **2**

EXECUTIVE SUMMARY **3**

1 INTRODUCTION AND CONTEXT **5**

1.1 GLOBE Capital 5

1.2 2017 Federal Budget 6

2 PANEL HIGHLIGHTS **9**

2.1 Panelists 9

2.2 Key Take-Aways 10

3 BREAK OUT DISCUSSION HIGHLIGHTS **12**

3.1 Discussion Topics 12

3.2 Cleantech Data Strategy: Collection and Standardization 15

3.2.1 Take Aways 17

3.3 Government Financing 17

3.3.1 Take Aways 18

3.4 Cleantech Export Opportunities 18

3.4.1 Take Aways 19

3.5 Procurement 13

3.5.1 Take Aways 15

4 CONCLUSION **20**

1 INTRODUCTION & CONTEXT

1.1 GLOBE Capital

Low carbon, resilient infrastructure spending is high on the Government of Canada's and on provincial governments' priority lists, at a time when it could not be more important in the context of global efforts to keep warming below two degrees and adapting to the impacts of climate change. According to The New Climate Economy[1], to ensure prosperity through the coming decades, leading economies will need to invest approximately $90 trillion by 2030 in advanced and resilient infrastructure.

To facilitate discussions regarding the efficient allocation of both private and public funding to this end, the GLOBE Series, known for the GLOBE Forum Leadership Summit on Sustainable Business, introduced *GLOBE Capital* in April 2017. *GLOBE Capital* was an invitation-only summit, which focused on how companies and governments might access the vast pools of capital needed to spur equitable and diversified growth. *GLOBE Capital* brought together the broader markets and players able to effect necessary policy changes, including CEOs from Canada's major banks and pension funds, industry leaders, and provincial and federal policy makers and leaders.

Clean technology is a critical part of the development of resilient, low-carbon infrastructure. Infrastructure and clean technology investments have been introduced side by side by the Trudeau government in the Pan-Canadian Framework, and in Budgets 2016 and 2017. Provincial governments are similarly making policy and funding commitments to support clean technology investment. Accordingly, *GLOBE Capital* allocated one of the two days of the conference to clean technology.

[1] http://newclimateeconomy.net/

GLOBE Capital's Cleantech Agenda targeted how financing gaps can be best bridged to stimulate growth, how international markets will play a role in exports, and what the prioritization of cleantech in the pan-Canadian framework means for Canada's cleantech sector.

Many of the panel discussions on cleantech featured references to the 2017 Federal Budget, which has been lauded for its focus on clean technology, innovation, and the low carbon economy. Dialogue focused on the move to delivery and the need to focus on rapid implementation.

1.2 2017 Federal Budget

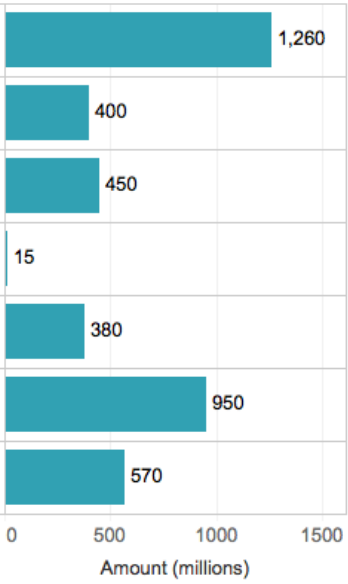
The 2017 Federal Budget was released two weeks before *GLOBE Capital*, on March 22nd. It tackles some of the challenges that the Canadian cleantech industry currently faces, including stalled growth and shrinking market share.

According to a report released by Analytica Advisors in 2016, revenues in the Canadian cleantech sector declined in 2014 from $11.7 to $11.6 billion. This stall in the cleantech sector's growth is attributed to capital constraints and a sluggish economy. The same report announced that Canada's share of the international market shrank from 2.2 percent in 2005 to 1.3 percent in 2014.

One of the largest barriers to Canadian cleantech competitiveness, according to a 2016 Sustainable Development Technology Canada (SDTC) and Cycle Capital Management report, is that Canadian companies lag in terms of commercializing research into market-ready technologies. Commercialization requires funding, but investors hesitate to invest without successful demonstration of technology at a commercial scale. The same report found that Canada lags on a per capita basis in both venture capital (VC) and debt financing, two critical components to scaling and commercializing technologies. Budget 2017 attempts to tackle this barrier head-on with a few key investments to accelerate commercialization and growth, identified in Table 1, below.

Table 1: Budget Investments in Commercialization and Growth

Category	Description	Years	Amount (millions)
Accelerating Commercialization and Growth	A new Strategic Innovation Fund to support new high-quality business investments in sectors including clean technology (with $100 million specifically for clean tech)	5	1,260
	A new Venture Capital Catalyst Initiative to increase late stage capital available to Canadian entrepreneurs through BDC	3	400
	Additional project finance for high capital intensive clean technology firms through BDC and EDC	-	450
	An international business development strategy to help Canadian clean technology firms to become world leaders and capitalize on growth global market opportunities, implemented by Global Affairs Canada	4	15
	Equity financing to support clean technology firms through Business Development Bank of Canada (BDC) and Export Development Canada (EDC)	3	380
	To support a small number of business-led innovation 'super clusters' that have the greatest potential to accelerate economic growth, such as clean technology	5	950
	Working capital to support clean technology through BDC and EDC	3	570



The budget also continues to support other stages of the cleantech growth pipeline. The allocations identified in Table 2 will go towards building early-stage innovation, fostering greater adoption, and strengthening collaboration and metrics for success.

The commitments made in the 2017 Federal Budget are a starting point in a journey towards a more robust and competitive Canadian cleantech sector. However, funding criteria and other details need to be fleshed out before these commitments can yield results. The government is starting by collecting data on Canada's cleantech sector in order to better understand its sub-sectors, size, strengths and weaknesses. Doing so will require collaboration from existing stakeholders in the Canadian cleantech space. These stakeholders, such as incubators, VCs, research organizations and cleantech firms will also be critical to developing an overarching strategy to put federal funding into action.

Table 2: Budget Investments in Canadian Cleantech Pipeline Growth

Sector: Buildings, Energy, General, Natural Resource, Transportation

Category	Description	Years	Amount (millions)
Building Early-Stage Development	To address big challenges such as helping Canada's rural and remote communities reduce their reliance on diesel as a power source	2	75.0
	To Natural Resources Canada and Transport Canada to continue research and development activities through their core clean energy and clean transportation innovation programming	4	229.0
	To Natural Resources Canada, Agriculture and Agri-Food Canada and Fisheries and Oceans Canada to support clean technology research, development, demonstration and adoption of clean technology in Canada's natural resources sectors	4	200.0
	To support projects across Canada to develop and demonstrate new clean technologies that promote sustainable development by re-capitalizing SDTC's SD Tech Fund	5	400.0
Fostering Greater Adoption	Expand eligibility for accelerated capital cost allowance to a broader range of geothermal projects and expenses to encourage greater use of geothermal energy to meet Canada's heating and electricity generation needs	-	0.0
	To deploy infrastructure for electric vehicle charging and natural gas and hydrogen refueling stations, as well as to support technology demonstration projects	4	120.0
	To develop and implement new building codes to retrofit existing buildings and build new net-zero energy consumption buildings across Canada	11	182.0
	To launch a new procurement program modeled on the US Small Business Innovation Research Program to support early-stage research and development, late-stage prototypes and other goods and services for Canadian innovators and entrepreneurs	-	50.0
	To reduce the reliance of rural and remote communities south of the 60th parallel on diesel fuel , and support the use of more sustainable renewable power solutions	-	220.0
	To support next generation smart grid, storage and clean electricity technology demonstration projects	11	100.0
	To support the deployment of emerging renewable energy technologies nearing commercialization	11	200.0
Strengthening Collaboration and Metrics for Success	Develop a clean technology data strategy to improve knowledge in the private sector and stakeholder communities and help inform future government decision making through Natural Resources Canada and Innovation, Science and Economic Development Canada	4	14.5
	Establish a Clean Growth Hub within the newly announced Innovation Canada single-window service, to, among other things, connect stakeholders to international markets	4	12.0
	To develop a comprehensive clean technology strategy to identify innovation opportunities, set ambitious growth targets, pinpoint sector-specific challenges and 'bottlenecks' to innovation	-	0.0

2 PANEL HIGHLIGHTS

The session opened with a panel discussion, with opening remarks from Minister Reza Moridi. A full list of the speakers with their backgrounds is covered in Table 3 below.

2.1 Panelists

Table 3: Speakers and Their Backgrounds

Role	Speaker	Title	Background
Opening Remarks	Reza Moridi	Minister of Research, Innovation and Science, Ontario	Reza Moridi was first elected to the Ontario legislature in 2007 as MPP for Richmond Hill. He previously held positions as Minister of Research and Innovation, and as Minister of Training, Colleges and Universities. Before entering politics, Minister Moridi was Vice-President and Chief Scientist at the Radiation Safety Institute of Canada.
Moderator	Leah Lawrence	President and CEO, SDTC	Leah Lawrence has a diverse range of experiences prior to her role at SDTC, including running Clean Energy Capitalists and chairing the boards of the Calgary Chamber of Commerce and The Association of Professional Engineers and Geoscientists (APEGA). Ms. Lawrence has been in her current role since 2015.
Panelist	Kousay Said	President and CEO, Green Mantra Technologies	Prior to his current role at Green Mantra Technologies, Kousay Said served as Chief Commercial Officer of Sirrus Inc., and as the Chief Executive Officer of ZeroBase Energy, LLC. Mr. Said has been in his current role at Green Mantra for just over one and a half years.

Panelist	Joe Kuhach	CEO, NSolv	Joe Kuhach is a registered professional engineer with previous positions as a Manager of Technology with Shell, and Sr. Vice President Upstream Technology and Integration with Ivanhoe Energy. Mr. Kuhach has been in his current role at NSolv for just over two and a half years.
Panelist	Eric Murray	President and CEO, Temporal Power	Eric Murray has worked with a number of Canadian Cleantech successes including Temporal Power, Pulse Energy, and Tantalus Systems, and is a member of the Department of Foreign Affairs, Trade and Development Cleantech advisory board. Mr. Murray has been in his current role at Temporal Power for almost two years.

2.2 Key Take-Aways

The panel discussion covered a range of personal experiences from the panelists, each of whom has had an extensive career in the cleantech sector. Several key take-aways were evident from the discussion.

Risk: Industry looking to deploy cleantech in Canada is largely seen as risk averse. Many companies and the public sector buying these technologies are keen to be the second, rather than first, adopter of a new technology. As the second adopter, companies can take advantage of learnings that they do not need to pay for. This attitude can lead to a protracted first sale and an extended stay in the valley of death. Investors are also risk averse. They have perceived risks about commercializing technically proven technologies that may or may not be accurate.

Scale: According to Minister Moridi, innovation is originated in Canada, but does not seem to scale up here. The panelists agreed, adding that when scaling a cleantech solution, technology performance validation is the most common challenge for a company. Policy and regulatory frameworks can support the drivers for adopting new technology, and therefore the testing and performance.

Having a first customer that is a strong advocate for the technology is key. Companies can also scale faster by building a commercial team before completing the first few projects. This prevents delays in broadening the customer base.

First customers: First customers are key to developing a risk mitigation strategy, and to marketing a cleantech product. Often, first customers can be a company's biggest ambassador, as well as provide performance validation, as above. For example, a local customer in Canada validates a technologies worth, especially in some foreign markets where potential customers may place some emphasis on home sales. However, Canada doesn't always buy Canadian. Hence, government procurement commitments become even more important to growing the Canadian cleantech sector.

Public Funding: When using public funding, its important to make sure that the company is aligned with what the fund wants it to do, which is hard when its just being used for capital expenses. Public money tends to be project centred, focusing on investment in technology and facilities to test the technologies. The ingredients to grow and scale cleantech companies often span other critical elements like the right management and commercial teams, different product and financing partnerships, the right supply chain, etc. Hence, existing public funds don't always fit the various scaling and commercialization needs of growing cleantech companies.

3 BREAK OUT DISCUSSION HIGHLIGHTS

3.1 Discussion Topics

The session was designed to have 6 breakout tables of approximately 10 participants each. The topics where shared with the audience and participants self-selected the issue of greatest interest. These issues were discussed in greater detail and leveraged a set of clarifying questions that were designed to sponsor dialogue:

1. Government Procurement
    a. Does government play a role in CT procurement?
    b. How should government support early commercial adoption?
    c. What are or could be effective approaches to direct public procurement of cleantech?
2. Private Sector Procurement
    a. Can/should the private sector commit to be early adopters / co-developers of early TRL scale technologies and, if so, how?
    b. What role should better communication of industry needs play in the private sector commitment to CT procurement?
    c. What systems need to be in place within industry to enable CT procurement?
3. The Standardization of Data Requirements Across Funding Agencies
    a. Is data gathering a pain point for companies?
    b. If so, would more consistent data requirements be useful for CT companies and/or funding agencies?
    c. How can agencies begin to align requirements whilst respecting individual mandates?
    d. Who takes the first step and how?
4. The Federal Cleantech Data Strategy
    a. What kind of data do you think is needed by whom?
    b. How should data be collected?
    c. How should data be stored?
5. Government Financing
    a. What input would you provide for shaping and implementing the 2017 Federal Budget commitments to BDC and EDC to help develop clean tech firms and clean technology?
    b. How do we move resources quickly and with the greatest impact?

6. Cleantech Export Opportunities
    a. What input would you provide regarding the international business development strategy to help Canadian cleantech firms to become world leaders?
    b. What other mechanisms should be enhanced, modified or created?

During the session, the standardization of data and the federal cleantech data strategy conversations happened at the same table, and have been summarized together under one of the sections below. While the government and private sector procurement discussions happened at separate tables, the course of their discussions were similar, and therefore are also summarized under one section below.

The following sections provide context for the each of the topics listed above, and summarize the results of the conversations at each table.

3.2 Procurement

According to session participants, both government and the private sector are averse to risk. But early adopter risk is essential to advancing new technologies, and the Canadian cleantech sector is made up of many new technologies that are pre-commercial. There are some differences between government, Table 4, and private, Table 5, procurement processes, therefore break-out tables on procurement were split into those two categories. Ultimately, very similar challenges emerged in each conversation.

Table 4: Government Procurement

Challenges	Opportunities and Solutions
- The procurement process lacks metrics to measure success and impact - There is not currently a strategy to ensure procurement from different industries - How can government procure technologies that are applied outside of government buildings? - Need to have more opportunities for smaller companies to influence	- Use specific targets, or separate procurement categories to ensure clean technology is procured from different industries - Use an RFP model to procure clean technology

and participate in government procurement - The government is perceived as 'not in the business of taking on risk' - Neither private sector nor government has expertise in selecting and supporting 'winning' companies	

Table 5: Private Sector Procurement	
Challenges	**Opportunities and Solutions**
- Mandate or decide on a set number of projects over a set number of years in order to ensure new technologies are procured by the private sector. - The private sector is perceived as 'not in the business of taking on risk,' but also wants to participate in the use of new clean technologies. - New technologies may have other risks to business such as adverse effects on production that are not evaluated. - Neither private sector nor government has expertise in selecting and supporting 'winning' companies. - The limited funding that is available for procurement does not attract all of the players in an industry. - Canadian culture is not as aggressive about innovating with new technology as US culture is.	- Replicate the COSIA model to help with procurement – use as a model of collaboration and sharing IP. - If government / private sector could match each others' investments in risky new technologies, more funding could be raised. - Use revenues from carbon pricing as a catalyst to promote innovation. - Measure and validate the impact a new technology/process has on core business issues compared to incumbent technologies and processes.

3.2.1 Take Aways

Although government and private procurement are different, they face many of the same challenges and demands from the Canadian cleantech sector. Neither has an effective strategy to consistently find the most promising new technologies and pilot them.

The procurement process itself may need a data strategy to more systematically track the success/performance of new technologies and process improvements investments and search for new purchase opportunities opportunities. And, similar to the case of government funding, releasing a clearer set of guidelines both from government and the private sector as to their procurement strategy (including risk tolerance and targeted technologies) so that they can streamline the procurement process. A more fulsome disclosure of performance beyond the environmental benefits could facilitate public and private sector adoption.

3.3 Cleantech Data Strategy: Collection and Standardization

The 2017 Federal Budget includes $14.5 million towards developing a clean technology data strategy. The government will not be working from square one to collect cleantech data; the industry has been collecting information on an adhoc basis for the last several years. The current data landscape presents two challenges moving forward: how to assess and combine the existing information, and how to collect new information in a way that will fill existing gaps. The discussion on cleantech data naturally broke into two categories: collecting cleantech information, summarized in Table 6, and standardizing cleantech information, summarized in Table 7.

Table 6: Collecting Cleantech Information

Challenges	Opportunities and Solutions
- Too many companies are collecting information from cleantech firms. Cleantech companies, especially small ones, have difficulty coping with the volume of requests for information. - Cleantech companies will not respond to all requests for data; they do not all understand that data is necessary to shape the	- Use MOUs to get around confidentiality concerns. - Natural Resources Canada (NRCan) is working with Statistics Canada (StatCan) to define cleantech. The definition will include environmental goods and services, and an aspect about novel IP and goods.

services and supporting policies / funding that they will receive. Some cleantech companies will only respond to inquiries from organizations that they have a personal relationship with. - Data collectors need to make sure that if cleantech data is being collected for a central database, it is made clear which pieces of information are confidential and which can be shared publically. - Still do not have an official definition of cleantech. This makes it difficult to understand how to classify small cleantech-specialized firms compared to large sector companies that are also investing in cleantech projects.	

Table 7: Standardizing cleantech information

Challenges	Opportunities and Solutions
- Different agencies that collect cleantech data have different mandates, and therefore are collecting information that isn't easy to standardize. - Combining existing databases presents challenges of double counting. - Funding agencies such as SDTC and NRCan have to standardize / amalgamate their databases. - There is a need a taxonomy / complete list of the cleantech sector in order to enable policies and distribute funding.	- There is an opportunity to use the Federal database as an aggregator, and put federal resources towards sorting the existing cleantech data. - Can use the existing SDTC internal database of cleantech companies as a starting point to creating a complete, federal database of Canadian cleantech firms. The SDTC database is now starting to reach a point where it can be used to analyse trends like revenue growth. - Federal resources may be able to collect data on cleantech that was previously inaccessible.

3.3.1 Take Aways

A clear taxonomy that defines and categorizes the cleantech sector in Canada is necessary in order to continue the process of standardizing existing cleantech sector data, and collecting new cleantech sector data. This work in the federal government is being led by NRCan, StatCan, and ISED, with input from key agencies such as SDTC.

A comprehensive cleantech database that has the ability to project revenue and growth trends, and identify strengths and weaknesses within the Canadian cleantech sector, is an important first step in designing the comprehensive clean technology strategy described in the 2017 Federal Budget.

The strategy is intended to identify innovation opportunities, set ambitious growth targets, and pinpoint sector-specific challenges and 'bottlenecks' to innovation. Such a strategy includes allocating government funding, developing an export strategy, and streamlining procurement. The right data will have an impact in each of these areas, and on many of the challenges that were raised during the following discussions.

3.4 Government Financing

The Federal Government took the first step in tackling some of the financing challenges that the Canadian cleantech sector has faced over the last several years by allocating funds in the 2017 Federal Budget towards developing the clean technology pipeline. It is one thing to earmark funds for a particular cause, and another to decide which technologies, companies, and organizations should receive some of the funding. This break-out table discussion highlights some of the challenges that remain to allocating government funding, summarized in Table 8.

Table 8: Government Financing

Challenges	Opportunities and Solutions
- There is currently a lack of detail available on the criteria for grants, and the rules around where funding is going. - There is less emphasis now on early stage VC, pre-commercial funding. It seems like funding is only available for technology readiness level (TRL) 9.	- Have a mentor within the government in order to help companies build their profile, critique their business model, and access government funding.

- It is almost a full-time job to understand and apply for government funding. - BDC and EDC need to take on higher risk investments than they have committed to.	

3.4.1 Take Aways

Concerns still exist in the cleantech sector about which kinds of technologies and companies will be able to access federal funding. Some of these concerns could be mitigated with clearer instructions on how funding will be allocated, with particular details on the technology readiness levels that are being targeted.

3.5 Cleantech Export Opportunities

A large proportion of Canadian cleantech companies export their technologies, and with the goal of exporting their technologies to achieve scale. Nonetheless, Canada's share of the international cleantech market has recently become smaller. The break-out table discussing export opportunities had many insights on how to improve Canada's export strategy, the results of which are captured in Table 9 below.

Table 9: Government Financing

Challenges	Opportunities and Solutions
- Field officers and consulates need more education on the topic of cleantech so that they can facilitate the export of Canadian cleantech. - Canadian cleantech takes too long to develop and scale, putting it at a disadvantage relative to competitor regions. - Super clusters introduce new risks, such as large multi-national tech companies taking IP - Canadian banks are not funding Canadian cleantech.	- A well-versed trade representative system on the ground can help sell Canadian cleantech in other countries and regions. - Implement proven strategies to market Canadian cleantech, such as CEO roundtables to introduce companies to domestic cleantech and branding strategies to energize local trade commissions. - Can leverage Canada's tax advantage, cheap dollar, and educated workforce to succeed in exporting cleantech. - Canadian cleantech is characterized by small companies – create opportunities by looking at the cleantech value chain and finding spaces where small

	companies can help each other (such as solar and storage companies). - Instead of looking to export to oversaturated markets, like California, explore less obvious markets like the regional ones in China and smaller Chinese cities. Trade commissioners can be helpful in making connections to these more remote areas. - Do not always need to use the Federal Government as a vehicle to connect to other regions – use initiatives like 'sister cities'.

3.5.1 Take Aways

Many of the tools already exist for a successful cleantech export strategy. The successful use of resources like trade commissioners and trade representatives depends on their knowledge of Canadian cleantech companies and of the markets that are interested in purchasing them, which can be improved. Innovative strategies, like CEO roundtables and leveraging 'sister city' relationships, or more recently, 'sister province' relationships like that recently set up between Alberta and Guangdong, have worked in specific cases and can be replicated and scaled.

4 CONCLUSION

Several key themes appeared throughout the working session:

Risk: It appears government and the private sector share some aspects of risk aversion. Many at the table during this session understood that each of the parties need to improve their risk tolerance for Canadian cleantech to be able to grow and scale at the rate that international competitors do. Risk was a topic that came up consistently during the panel discussion as well as in breakout groups.

Communication: Clearer communication about the criteria for funding, or for investing in new technologies,and for procurement were highly sought after. Clear articulation nof need on behalf of industry is key to not only tailoring solutions to meet the needs, but this will enable more rapid development and comnmercialization. From a government perspective, it also became clear that government funding allocation details may rely on the collection of cleantech data, which will provide insights on the highest growth areas within the sector and where resources can be most efficiently allocated.

Collaboration: Often the proposed solutions revolved around sector collaboration, much of which is already happening but can be expanded. Two examples are collaboration between companies that are part of the same value chain to export their services, and another is to replicate the COSIA model to help with procurement in the private sector.

Ultimately, with so much federal funding and increasing provincial funding being allocated towards cleantech, including at least one particular commitment to each of the four break out areas (cleantech data, cleantech pipeline, export, and procurement) the Canadian cleantech sector is faced with an enormous opportunity to regain its market share. However, there are many steps that now must be taken for that funding to be used as effectively as possible. The broad areas where action is perceived as necessary are identified above, the most important of which is improving the receptors' and funders' tolerance for risk.